

**REMARKS**

In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the present application. This amendment is believed to be fully responsive to all issues raised in the May 12, 2004, Office action.

**Examiner Interview Summary**

Applicants thank the Examiner for participating in a telephone interviews on June 30, 2004 and July 9, 2004. The participants in the June 30<sup>th</sup> interview were Michael F. Cohen, Peter-Pike J. Sloan, Examiner Javid A Amini, Primary Examiner Jeffery Brier, and Damon Rieth. The participants in the July 9<sup>th</sup> interview were Examiner Javid A Amini and Damon Rieth.

In the June 30<sup>th</sup> interview, independent claim 1 was discussed with respect to the reference entitled "A Muscle Model for Animating Three-Dimensional Facial Expression," by Keith Waters. It was proposed that the change to the grammar of claim 1 shown above in the Listing of the Claims section would make it easier to distinguish the patentable distinctions between the invention defined by claim 1 and system described in the Waters reference, without narrowing the claim in any way. Similar amendments, also shown in the Listing of the Claims section above, were also proposed for independent claims 13, 22, 28, 34, 39, and 46. It was also suggested that the phrase "combining the single weight values" in claim 1 should be amended to "combining the single weight value".

1 In the July 9<sup>th</sup> interview, the 35 USC §112 rejections of claims 18, 27, 33,  
2 37, and 38 were discussed, and it was agreed that the claim rejections under 35  
3 USC §112 are rendered moot in light of the proposed amendments to independent  
4 claims 13, 22, 28, and 34 discussed in the June 30 interview.  
5

6  
7 **Claims Rejected Under - 35 USC §112**

8 Claims 18, 27, 33, 37, and 38 stand rejected under 35 USC §112 as being  
9 indefinite for failing to particularly point out and distinctly claim the subject  
10 matter which applicant regards as the invention. In light of the July 9 Examiner  
11 interview, these rejections are believed to be moot.

12 Each of independent claims 13, 22, 28, and 34 has been amended as  
13 discussed in the June 30 Examiner interview, as shown above in the Listing of  
14 Claims. As such, the rejections of claims 18, 27, 33, 37, and 38 are believed to be  
15 resolved based on the July 9, 2004 Examiner interview. Accordingly, the  
16 Applicant requests withdrawal of the rejections of claims 18, 27, 33, 37, and 38  
17 under 35 USC §112.  
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19  
20 **Claims Rejected Under - 35 USC §102(a)**

21 Claims 1-15, 19-26, 28-32, 34-36, and 39-46 stand rejected under 35 USC  
22 §102(a) as being anticipated by Computer Graphic, Keith Waters, "A muscle  
23 Model for Animating Three-Dimensional Facial Expressions," July 1987, Volume  
24 21, number 4, pp 17-24 (hereinafter "Waters"). Although the Applicant disagrees  
25

1 with these rejections, the independent claims have been amended in accordance  
2 with the June 30 Examiner interview to put the claims in better form and to  
3 expedite allowance.

4 Specifically, claim 1 reads as follows:

5 1. A blending method comprising:  
6 providing a set of examples that pertain to a shape or motion  
7 that is to be animated, the examples being placed within a multi-  
8 dimensional abstract space, wherein each dimension of the abstract  
9 space is defined by at least one of an adjective and an adverb;  
10 selecting a point within the multi-dimensional abstract space  
11 that does not coincide with a point that is associated with any of the  
12 examples, the selected point corresponding to a shape or motion  
13 within the abstract space;  
14 computing a single weight value for each of the examples;  
15 and  
16 combining the single weight values for each of the examples  
17 in a manner that defines an interpolated shape or motion that is a  
18 blended combination of each of the examples of the set of examples.

19 With respect to Waters, and as was discussed in the June 15 interview,  
20 Waters describes a method for modeling facial expressions using muscle models.  
21 That is, Waters describes creating various facial expressions by changing the  
22 underlying muscles in a model of a face. Waters shows various individual facial  
23 expressions that can be constructed using Waters muscle modeling. The facial  
24 expressions in Waters are apparently each modeled separately from one another.  
25 There is no discussion in Waters of blending existing facial expressions to produce  
a new facial expression.

Waters does not teach or suggest, for example, a blending method  
comprising providing a set of examples that pertain to a shape or motion that is to

1 be animated, the examples being placed within a multi-dimensional abstract space,  
2 wherein each dimension of the abstract space is defined by at least one of an  
3 adjective and an adverb, as is recited in claim 1. Therefore, Waters fails to teach  
4 or suggest all of the limitations of claim 1.

5 As such, claim 1 is believed to be allowable over the art of record. Claims  
6 2-12 each depend in some form from claim 1. Therefore, claims 2-12 are believed  
7 to be allowable for at least the same reasons as claim 1. Additionally, each of  
8 claims 2-12 also adds limitations that are neither taught nor suggested by the art of  
9 record.  
10

11 Independent claim 13 reads as follows:

12 13. (Currently Amended) A blending method  
13 comprising:

14 linearly approximating a degree of freedom that is associated  
15 with a new form or motion that is to be rendered based upon a  
16 plurality of examples that define respective forms or motions within  
17 a multi-dimensional abstract space, wherein each dimension of the  
18 abstract space is defined by at least one of an adjective and an  
19 adverb;

20 defining a radial basis function for each of the examples;

21 combining the linear approximation and the radial basis  
22 functions to provide a cardinal basis function; and

23 using the cardinal basis function to render the new form or  
24 motion.  
25

21 As discussed above and at the June 15 Examiner interview, Waters shows  
22 various individual facial expressions that are each modeled separately from one  
23 another. There is no discussion in Waters of blending existing facial expressions to  
24 produce a new facial expression.  
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1 Waters does not teach or suggest, for example, a blending method  
2 comprising linearly approximating a degree of freedom that is associated with a  
3 new form or motion that is to be rendered based upon a plurality of examples that  
4 define respective forms or motions within a multi-dimensional abstract space,  
5 wherein each dimension of the abstract space is defined by at least one of an  
6 adjective and an adverb, as is recited in claim 13. Accordingly, Waters fails to  
7 teach or suggest at least one of the limitations of claim 13.  
8

9 As such, claim 13 is believed to be allowable over the art of record. Claims  
10 14, 15, and 19 - 21 each depend in some form from claim 13. Claims 14, 15, and  
11 19 - 21 are believed to be allowable for at least the same reasons as claim 13. In  
12 addition, each of claims 14, 15, and 19 - 21 includes other limitations that are not  
13 taught or suggested by the art of record.  
14

15 Independent claim 22 reads as follows:

16 22. One or more computer-readable media having  
17 computer-readable instructions thereon which, when executed by a  
18 computer, cause the computer to:

19 linearly approximate a degree of freedom that is associated  
20 with a new form or motion that is to be rendered based upon a  
21 plurality of examples that define respective forms or motions within  
22 a multi-dimensional abstract space, by deriving basis hyperplanes  
23 that fit a least squares hyperplane to a case where one example has a  
24 value of 1 and the remaining examples have values of 0, wherein  
25 each dimension of the abstract space is defined by at least one of an  
adjective and an adverb;

account for residuals between the example values and the  
hyperplane by:

23 associating a radial basis function with each example;  
24 ascertaining a radial basis weight value for each radial  
basis function; and  
25 scaling each radial basis function by its ascertained  
radial basis weight value; and

1 sum the linear approximation and scaled radial basis  
2 functions to provide a cardinal basis function.

3 As discussed above and at the June 15 Examiner interview, Waters shows  
4 various individual facial expressions that are each modeled separately from one  
5 another. There is no discussion in Waters of blending existing facial expressions to  
6 produce a new facial expression.

7 Waters does not teach or suggest, for example, one or more computer-  
8 readable media having computer-readable instructions thereon which, when  
9 executed by a computer, cause the computer to linearly approximate a degree of  
10 freedom that is associated with a new form or motion that is to be rendered based  
11 upon a plurality of examples that define respective forms or motions within a  
12 multi-dimensional abstract space, by deriving basis hyperplanes that fit a least  
13 squares hyperplane to a case where one example has a value of 1 and the  
14 remaining examples have values of 0, wherein each dimension of the abstract  
15 space is defined by at least one of an adjective and an adverb, as is recited in claim  
16 22. As such, Waters fails to teach or suggest at least one of the limitations of  
17 claim 22.  
18  
19

20 As such, claim 22 is believed to be allowable over the art of record. Claims  
21 23 - 27 each depend in some form from claim 22. As such, claims 23 - 27 are  
22 believed to be allowable for at least the same reasons as claim 22. In addition,  
23 each of claims 23 - 27 includes other limitations that are neither taught nor  
24 suggested by the art of record.  
25

Independent claim 28 reads as follows:

28. A computerized blending system comprising:  
at least one computer-readable media;  
at least one processor;  
instructions resident on the computer-readable media which,  
when executed by the processor, cause the blending system to:  
linearly approximate a degree of freedom that is  
associated with a new form or motion that is to be rendered based  
upon a plurality of examples that define respective forms or motions  
within a multi-dimensional abstract space, by deriving basis  
hyperplanes that fit a least squares hyperplane to a case where one  
example has a value of 1 and the remaining examples have values of  
0, wherein each dimension of the abstract space is defined by at least  
one of an adjective and an adverb;  
account for residuals between the example values and the  
hyperplane by:  
associating a radial basis function with each example;  
ascertaining a radial basis weight value for each radial  
basis function; and  
scaling each radial basis function by its ascertained  
radial basis weight value; and  
sum the linear approximation and scaled radial basis  
functions to provide a cardinal basis function.

As discussed above and at the June 15 Examiner interview, Waters shows  
various individual facial expressions that are each modeled separately from one  
another. There is no discussion in Waters of blending existing facial expressions to  
produce a new facial expression.

Waters does not teach or suggest, for example, a computerized blending  
system comprising instructions resident on a computer-readable media which,  
when executed by a processor, cause the blending system to linearly approximate  
a degree of freedom that is associated with a new form or motion that is to be  
rendered based upon a plurality of examples that define respective forms or

1 motions within a multi-dimensional abstract space, by deriving basis hyperplanes  
2 that fit a least squares hyperplane to a case where one example has a value of 1  
3 and the remaining examples have values of 0, wherein each dimension of the  
4 abstract space is defined by at least one of an adjective and an adverb, as is recited  
5 in claim 28. Therefore, Waters fails to teach or suggest at least one of the  
6 limitations of claim 28.

7  
8 As such, claim 28 is believed to be allowable over the art of record. Claims  
9 29 – 33 each depend in some form from claim 28. Therefore, claims 29 – 33 are  
10 believed to be allowable for at least the same reasons as claim 28. In addition  
11 each of claims 29 – 33 adds other limitations that are neither taught nor suggested  
12 by the art of record.

13 Independent claim 34 reads as follows:

14 34. A blending method comprising:  
15 defining a set of examples that pertain to a form or motion  
16 that is to be animated, the examples being provided relative to a  
17 multi-dimensional abstract space, wherein each dimension of the  
18 abstract space is defined by at least one of an adjective and an  
19 adverb;  
20 examining a plurality of forms or motions that are animated  
21 within the abstract space from the defined set of examples;  
22 identifying at least one form or motion that is undesirable;  
23 selecting a form or motion from a location within the abstract  
24 space that is proximate a location that corresponds to the undesirable  
25 form or motion; and  
replacing the undesirable form or motion with the selected  
form or motion to provide a pseudo-example that constitutes a linear  
sum of the examples of the set of examples.

24 As discussed above and at the June 15 Examiner interview, Waters shows  
25 various individual facial expressions that are each modeled separately from one



1 another. There is no discussion in Waters of blending existing facial expressions to  
2 produce a new facial expression.

3 Waters does not teach or suggest, for example, a blending method  
4 comprising defining a set of examples that pertain to a form or motion that is to be  
5 animated, the examples being provided relative to a multi-dimensional abstract  
6 space, wherein each dimension of the abstract space is defined by at least one of  
7 an adjective and an adverb, as is recited in claim 34. As such, Waters fails to  
8 teach or suggest all of the limitations of claim 34.  
9

10 As such, claim 34 is believed to be allowable over the art of record. Claims  
11 35 - 38 each depends in some form from claim 34. As such, claims 35 - 38 are  
12 believed to be allowable for the same reasons as claim 34. In addition, each of  
13 claims 35 - 38 includes other limitations that are neither taught nor suggested by  
14 the art of record.  
15

16 Independent claim 39 reads as follows:

17 39. A blending method comprising:  
18 defining at least two examples of a form in a multi-  
19 dimensional abstract space, each dimension of the abstract space  
20 being defined by at least one of an adjective and an adverb, a first of  
21 the example forms being defined in a first position in the multi-  
22 dimensional abstract space and a second of the example forms being  
23 defined in a second position in the multi-dimensional abstract space  
24 that is different from the first position; and  
25 computing a form in the first position such that when the  
computed form is subjected to a transform blending operation that  
places the computed form in the second position, it will match the  
second example form.

1 As discussed above and at the June 15 Examiner interview, Waters shows  
2 various individual facial expressions that are each modeled separately from one  
3 another. There is no discussion in Waters of blending existing facial expressions to  
4 produce a new facial expression.

5 With respect to claim 39, Waters does not teach or suggest, for example, a  
6 blending method comprising defining at least two examples of a form in a multi-  
7 dimensional abstract space, each dimension of the abstract space being defined by  
8 at least one of an adjective and an adverb, a first of the example forms being  
9 defined in a first position in the multi-dimensional abstract space and a second of  
10 the example forms being defined in a second position in the multi-dimensional  
11 abstract space that is different from the first position. Therefore, Waters fails to  
12 teach or suggest all of the limitations of claim 39.

13 As such, claim 39 is believed to be allowable over the art of record. Claims  
14 40 - 45 each depends in some form from claim 39. Therefore, claims 40 - 45 are  
15 believed to be allowable for at least the same reasons as claim 39. In addition,  
16 each of claims 40 - 45 includes other limitations that are neither taught nor  
17 suggested by the art of record.

18 Independent claim 46 reads as follows:

19 46. One of more computer-readable media having  
20 computer-readable instructions thereon which, when executed by a  
21 computer, cause the computer to:  
22 define at least two examples of a form in a multi-dimensional  
23 abstract space, each dimension of the abstract space being defined by  
24 at least one of an adjective and an adverb, a first of the example  
25 forms being defined in a first position in the multi-dimensional  
abstract space and a second of the example forms being defined in a

1 second position in the multi-dimensional abstract space that is  
2 different from the first position; and

3 compute a form in the first position such that when the  
4 computed form is subjected to a transform blending operation that  
5 places the computed form in the second position, it will match the  
6 second example form.

7 As discussed above and at the June 15 Examiner interview, Waters shows  
8 various individual facial expressions that are each modeled separately from one  
9 another. There is no discussion in Waters of blending existing facial expressions to  
10 produce a new facial expression.

11 Waters does not teach or suggest, for example, one of more computer-  
12 readable media having computer-readable instructions thereon which, when  
13 executed by a computer, cause the computer to define at least two examples of a  
14 form in a multi-dimensional abstract space, each dimension of the abstract space  
15 being defined by at least one of an adjective and an adverb, a first of the example  
16 forms being defined in a first position in the multi-dimensional abstract space and  
17 a second of the example forms being defined in a second position in the multi-  
18 dimensional abstract space that is different from the first position, as is recited in  
19 claim 46. Therefore, Waters fails to teach or suggest all of the limitations of claim  
20 46.

21 As such, claim 46 is believed to be allowable over the art of record.  
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Allowable Subject Matter

Claims 16 and 17 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 16 and 17 each depend in some form from claim 13. As discussed above, claim 13 is believed to be allowable. Therefore, claims 16 and 17 are believed to be allowable, without amendment, for at least the same reasons as claim 13. Applicant requests that the objections to claims 16 and 17 be withdrawn.

CONCLUSION

Claims 1-46 are believed to be in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the present application. Should any issue remain that prevents immediate issuance of the application, the Examiner is encouraged to contact the undersigned attorney to discuss the unresolved issue.

Respectfully Submitted,

Dated: 7/20/04By: 

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